

SPECIFICATIONS FOR RAPID TRANSIT CARS

SECTION 6

DOOR CONTROL AND SIGNAL SYSTEM

6.01 Door Control

(a) The door control circuits shall provide for multiple unit door control operation. The connections of the door control, bell and buzzer train lines shall be controlled by drum switches of an approved type and shall establish the conductor's operating position and the door zones which he controls.

(b) Door control drum switches shall be provided in each motorman's cab, and, in two-car units, drum switches shall also be provided at the conductor's operating position at diagonally-opposite end of cars. Door control drum switches shall be key-operated, and shall be accessible when cab door is in position to enclose cab operating equipment.

(c) Door control drum switches shall be provided with three positions, marked "ON", "OFF" and "THRU". They shall control the necessary door control, bell and buzzer circuits as follows:

"ON" Position

1. The door control push button switches shall be energized at this location and the door circuits connected so that doors to the front and to the rear of the conductor's position, on the corresponding side only, may be controlled from the respective door control push button switches.

2. The signal push button shall be energized,

and bell and buzzer connected for operation.

3. Bell control train line circuits shall be broken, and buzzer control train line circuits carried through this location.

"OFF" Position

1. The door control push button switches at this location shall be inoperative.

2. The door control circuits shall be disconnected to establish end of door control zone at this point.

3. The signal push button shall be energized, and bell and buzzer connected for operation.

4. Bell and buzzer control train line circuits shall be carried through this location.

"THRU" Position

1. The door control push button switches, signal push button, bell and buzzer at this location shall be inoperative.

2. The door control, bell and buzzer circuits shall be carried through this location.

(d) An auxiliary drum switch shall be provided at each door control drum switch location to provide for independent opening of each door on the car in which the auxiliary drum switch is located and on the adjacent car, on the corresponding side only. The auxiliary drum switches shall be provided with two positions, marked

"NORMAL" and "IND". They shall control the door control circuits as follows:

"NORMAL" Position

1. The normal door control push button switches shall be energized at this location and the door circuits connected so that doors to the front and to the rear of the conductor's position, on the corresponding side only, may be controlled from their respective door control push buttons.

2. The independent door control push button switches shall be disconnected at this location.

"IND" Position

1. The independent door control push button switches shall be energized at this location and the door circuits connected so that individual doors on the car in which the auxiliary drum switch is located, and on the adjacent car, on the corresponding side only, may be opened from their respective door control push buttons.

2. The normal door control push button switches shall be energized at this location, and the door circuits connected so that doors to the front and to the rear of the conductor's position, on the corresponding side only, may be controlled from their respective door control push buttons, except that, normal door opening push button will not control doors on the car in which the auxiliary drum switch is located, nor on the adjacent car.

6.02 Door Control Push Buttons

(a) A door control push button box of approved type shall be provided at each motorman's cab, and at conductor's operating position at diagonally opposite end of two-car units, in an approved location. Door control push button boxes shall be enclosed when cab doors are in the non-operating position. At conductor's operating locations where cabs are not provided, a locked compartment shall be provided to enclose door control push buttons. Lock shall be operable with Railroad's standard key.

(b) Each door control push button box shall contain ten door control push button switches to control doors on corresponding side of train as follows:

- No. 1 Open all doors to front of location.
- No. 2 Open all doors to rear of location.
- No. 3 Close all doors to front of location.
- No. 4 Close all doors to rear of location.
- No. 5 Open Door #1 - Operating Car
- No. 6 Open Door #2 - Operating Car
- No. 7 Open Door #3 - Operating Car
- No. 8 Open Door #1 - Adjacent Car
- No. 9 Open Door #2 - Adjacent Car
- No.10 Open Door #3 - Adjacent Car

(c) All door-open push buttons shall be adequately shielded to prevent accidental operation.

(d) Door control push button switches shall be of an approved type. Access shall be provided to contacts without disarranging wire connections.

(e) A signal push button switch shall be contained in the door control push button box.

6.03 Door Control Circuits

(a) Door control circuits shall be protected with circuit

breakers arranged to open under overload. Circuit breakers shall be located so that they can be reset conveniently from the conductor's operating location.

(b) Circuits controlling end doors opposite motorman's cabs shall be controlled over the draw bar drum switch or coupler electric portion so that doors at both ends of trains will be inoperative.

6.04 Door Control Key Switches

(a) Key switches shall be provided at doors adjacent to motorman's cabs, and at diagonally-opposite ends of two-car units. Key switches shall be operable with the Railroad's standard key from either interior or exterior of the car. Operation of key switch shall control adjacent doors only.

(b) Key switches shall be designed so that key may be withdrawn after key switch has been operated to open door, and the door will remain open. Means shall be provided to close doors that have been opened by use of the key switch by normal operation of the door closing buttons at the conductor's operating location.

6.05 Motorman's Foot Switch

(a) A spring-return foot switch shall be installed in each motorman's cab, which when depressed, will prevent opening of all doors on the train in the event that the train is stopped short or over-runs station platforms.

(b) When depressed, the foot switch shall also energize the buzzer at the conductor's operating position to serve as a warning.

(c) Foot switch shall be operative only at locations where drum switch is in the "OFF" position.

6.06 Door Signals

(a) A door signal light shall be provided in each motorman's cab. When lighted, it shall indicate that all side doors on the train are closed and locked.

(b) Circuits shall be so arranged that motorman's door signal light shall be operative only when controller reverser handle is in either the "FORWARD" or "REVERSE" position.

(c) Door signal light circuit shall be energized at rear end of train through contacts on the drawbar drum switch or coupler electric portion in the "UNCOUPLED" position.

(d) The door signal light circuit shall be interlocked with the traction motor control circuits so that power cannot be applied to the traction motors with the doors open. A sealed release switch of approved type shall be provided in each motorman's cab to nullify action of the interlocking circuit in an emergency.

(e) Door pilot lights shall be provided on each side of each car adjacent to center door. Pilot lights shall be equipped with red lenses facing to front and rear, and shall be lighted when any side door in the car is open.

6.07 Bell and Buzzer Signal System

(a) Each car shall be equipped with a bell and buzzer signal system, operated on the 32-volt battery circuit. From the push button located in the door control push button box, the rear trainman may signal by means of a bell to the conductor's position, and the conductor may signal by means of a bell to the motorman's position. From the push button located in the door control switch box, the motorman may signal to the conductor and to the rear

trainman by means of a buzzer. The buzzer system will also function in connection with the motorman's foot switch as described in Section 7.05 of these specifications.

(b) Bells and buzzers shall be located at each motorman's cab, and in addition at conductor's operating locations in two-car units.

(c) Circuits shall be so arranged that conductor's signal push buttons, bells and buzzers shall be operative at locations where door control drum switches are in either the "ON" or "OFF" position, and inoperative at locations where drum switches are in the "THRU" position.

(d) Bell control train line circuits shall be broken at locations where door control drum switches are in the "ON" position, and carried through locations where drum switches are in either "OFF" or "THRU" positions.

(e) Buzzer control train line circuits shall be carried through all locations, irrespective of position of drum switches.

(f) Bells shall be of the single-stroke type. Bells and buzzers shall be of approved type and suitable for railway service.